UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,497	11/14/2003	Motoaki Wakui	81784.0293	1021

26021 7590 06/30/2005

HOGAN & HARTSON L.L.P.
500 S. GRAND AVENUE
SUITE 1900
LOS ANGELES, CA 90071-2611

EXAMINER	
TRINH, MICHAEL MANH	
ART UNIT	**PAPER NUMBER**
2822	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/714,497	WAKUI ET AL.	
	Examiner	Art Unit	
	Michael Trinh	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11-14-2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

*** This office action is in response to filling of the application on November 14, 2003. Claims 1-7 are pending.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-2,7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted prior art in view of Boucher et al (6,354,909).

Applicant's admitted prior art teaches (at Figures 4, 5 S10-S22) a semiconductor device manufacturing method, comprising: a first step of forming a laminated structure by adhering, on a semiconductor substrate 10 including a plurality of integrated circuits, a carrier member 2,3 covering a region in which the plurality of integrated circuits are formed, with an insulating resin 5 interposed between the semiconductor substrate 10 and the carrier member 2,3 (Figure 5 S12); a second step of cutting on the laminated structure so as to cut the semiconductor substrate together with the insulating resin 5 while allowing at least a portion of the carrier member 2 to remain uncut (Fig 5 S14); and a third step of dividing the laminated structure by cutting the carrier member (Fig 5 S22); wherein the second step is performed with a dicing saw used to cut into the laminated structure including the semiconductor substrate (Figs 5 S22 and 6). Re claim 7, the method further comprises forming metal wiring 28 on a machined surface of the laminated structure (Fig 5 S16).

Re claim 1, Applicant's admitted prior art lacks cooling the dicing saw while cutting the semiconductor substrate. Re claim 2, cooling is executed by spraying a coolant on the dicing saw.

However, Boucher teaches (at Figures 1-2; col 14, lines 21-64) cooling the dicing saw while cutting the semiconductor substrate by spraying a coolant from the nozzle 44 on the dicing saw 18.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the dicing method of Applicant's admitted prior art by cooling the dicing saw used to cut into the laminated structure including the semiconductor substrate, as taught by Boucher. This is because of the desirability to reduce temperature of the semiconductor substrate and the dicing saw, and because of the desirability to remove particles generated during cutting.

5. Claims 3,4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted prior art in view of Boucher et al (6,354,909), as applied to claims 1-2,7 above, and further of Sutherland et al (5,461,008).

The references including Applicant's admitted prior art and Boucher teach a semiconductor device manufacturing method as applied to claims 1,2 and 7 above.

Re claim 4, the references lack spraying the coolant with a spraying width larger than the width of the dicing saw; Re claim 7, with a coolant having a pH value from 4 and 6; and Re claim 3, spraying the coolant at an angle elevation of from 5 and 45 degrees.

However, re claim 4, Sutherland teaches (at Fig 2, col 2, lines 30-40; col 3, lines 1-29) spraying the coolant to the dicing saw while cutting the semiconductor substrate, wherein the coolant is sprayed with a spraying width larger than the width of the dicing saw (Figs 1-2), wherein, re claim 7, the coolant is having a pH value of about 3.5 to 5.5, preferably 4 (col 6, lines 27-35, lines 9-50). Re claim 3, Boucher teaches (at Figures 1 and 2; col 14, lines 21-45) to provide coolant streams to the cutting edges of the dicing saw, wherein the nozzles 44 for spraying the coolant, as shown in Figures 1-2, are elevated at an angle elevation of about 45 degrees. Sutherland also teaches to spray coolant to the dicing saw, wherein the coolant is spraying at an angle elevation of less than 45 degrees from the nozzle 46a (Figs 1-2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the dicing method of the references including Applicant's admitted prior art and Boucher by spraying coolant with a spraying width larger than the width of the dicing saw with the coolant having a pH value from 4 and 6, as taught by Sutherland. This is because of the desirability to flood the coolant to the entire width of the dicing saw so that to cool the dicing saw in an effective manner. This is also because of the desirability to deleterious corrosion and prevent adhesion of the residue particles to the aluminum bonding pads.

Furthermore, the subject matter as a whole would have been obvious to one or ordinary skill in the art at the time the invention was made to select the portion of the prior art's range of angle for spraying the coolant from the nozzles to the dicing saw at an angle less than about 45 degrees, as shown by Boucher and Sutherland, which is within the range of applicant's claims, because it has been held to be obvious to select a value in a known range by optimization for the best results, and would be an unpatentable modification, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". *In Re Aller* 104 USPQ 233,255 (CCPA 1955); *In re Waite* 77 USPQ 586 (CCPA 1948); *In Re Swanson* 56 USPQ 372 (CCPA 1942); *In Re Sola* 25 USPQ 433 (CCPA 1935); and *In Re Dreyfus* 24 USPQ 52 (CCPA 1934).

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted prior art in view of Boucher et al (6,354,909) and Sutherland et al (5,461,008), as applied to claims 3,4,6 above, and further of Cook (6,454,190).

The references including Applicant's admitted prior art, Boucher and Sutherland teach a semiconductor device manufacturing method as applied to claims 3,4,6 above, wherein the coolant includes water (Sutherland, Abstract, col 6, lines 27-45; col 1, lines 28-36).

Re claim 5, the references already teaches using water as a coolant, but lack using RO water by passing tap water through an RO (reverse osmosis) film.

However, Cook teaches (at Abstract; col 2, lines 45-65) providing pure RO water by passing tap water through an reverse osmosis (RO) membrane film 38.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to spray the water coolant to the dicing saw of the combined references by

passing using passing the tap water through an reverse osmosis film as taught by Cook. This is because of the desirability to have high quality pure RO water as a coolant for cooling the dicing saw and the substrate and for removing residue particles, wherein clogging of the nozzle is also reduced as the pure RO water having very low mineral content.

****

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-16

Michael Trinh
Primary Examiner